

BY

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**VIA FACSIMILE AND HAND DELIVERY**

Betty Yee  
Regional Water Quality Control Board, Central Valley Region  
11020 Sun Center Drive #200  
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**Re: Comments on the 2009 Triennial Review/Salt Management Policy**

Dear Ms. Yee:

1. Submitting Organization: City of Tracy

The City of Tracy ("City") is keenly interested in salinity issues in the southern Sacramento-San Joaquin Delta ("southern Delta") due to the City's location within the southern Delta. Water from the Delta waters is transported via the Delta-Mendota Canal to supply a portion of the City's municipal drinking water supply. Once used by the City's businesses and residents, this water flows to the City's wastewater treatment plant and ultimately discharges into Old River. The City also owns nearly two square miles of irrigated farmland in the southern Delta. Thus, the City is interested in salinity issues not only as a discharger to Delta waters, but also as a beneficial user of such waters.

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3. Affected Waterbodies: Old River and the southern Delta
4. Affected Section of the Basin Plan:
  - a. Affected Beneficial Use: Agricultural Supply: Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing. The City is most concerned with application of this beneficial use to justify the imposition of water quality objectives to the entire southern Delta that are interpreted in an overly stringent manner so as to protect salt-sensitive crops that are minimally present in the use area.
  - b. Affected Water Quality Objective: Electrical Conductivity (EC) water quality objectives in the Regional Water Quality Control Board, Central Valley Region's, ("Regional Water Board") 1998 Water Quality Control Plan ("Basin Plan"), and incorporation of EC water quality objectives from the State Water Resources Control Board's ("State Water Board") Bay-Delta Plan. The City believes that the Regional Water Board should expand its analysis of the best method to measure and assess salinity for protection of beneficial uses in the southern Delta beyond EC, to include analysis of TDS (a preferable, more accurate measure), "effective" EC (only measuring the relevant EC that may impact agricultural beneficial uses), and/or individual salinity-related constituents, and then determine the most accurate and cost-effective manner to regulate salinity for the benefit of all interests in the southern Delta.

The Regional Water Board's Basin Plan incorporates by reference the numeric water quality objectives for EC for the protection of agricultural beneficial uses from the 1991 Bay-Delta Plan. *See* footnote on Table III-5, stating "\* Taken from the State Water Board's 'Water Quality Control Plan for Salinity,' May 1991"; *see also* Basin Plan at pg. III-6.00 "Salinity." The Regional Water Board did not include a prospective incorporation by reference of any future modifications to water quality objectives from the Bay-Delta Plan. The 1991 (and 1995) Bay-Delta Plan applied numeric EC objectives at four locations in the Delta (namely, San Joaquin River at Airport Way Bridge, Vernalis; Old River near Middle River; Old River at Tracy Road Bridge; and San Joaquin River at Brandt Bridge), and implementation of those objectives was to occur via regulation of water flow by federal and state agencies controlling Delta water flows and best management practices and waste discharge requirements for non-point source [agricultural] dischargers. *See* 1991 Bay-Delta Plan at Table 1-1, pgs. 2-2 and 7-5. Without appropriate analysis, the 2006 Bay-Delta Plan suddenly applied the numeric objectives to all waterways within the southern Delta, and implementation was expanded to include restrictions on municipal discharges to the southern Delta. These changes have not been incorporated into the Regional Water Board's Basin Plan.

As such, only the four compliance points currently referenced in the Basin Plan can be used for impairment determinations for the southern Delta<sup>1</sup> and for reasonable potential determinations prior to NPDES permitting decisions. It is the City's understanding from staff at the State Water Board that the purported "non-substantive" modifications to the 2006 Bay-Delta Plan's water quality objectives for EC have not yet been approved by the U.S. EPA, and therefore, cannot be used as "applicable water quality standards" for Clean Water Act/NPDES permitting purposes. Under federal case law and federal regulations, state water quality standards adopted after May 30, 2000 are not valid under federal law until explicitly approved by U.S. EPA. *See* 40 C.F.R. §131.21(c)(2).

If the Regional Water Board wants to incorporate into its Basin Plan the not-yet effective and inadequate 2006 modifications to the Bay-Delta Plan, the Regional Water Board must first undertake analysis in compliance with Water Code section 13241 (analyzing whether expansion of the objectives, both geographically and to the specified types of discharges, is appropriate), and amend the Basin Plan's implementation plan for EC to incorporate a plan for relevant and affected municipal dischargers, including the City. Prior to implementation, the revised water quality objectives for EC would need to be approved by the U.S. EPA. None of these activities has yet occurred; therefore, the Regional Water Board cannot yet impose the EC objectives from the 2006 Bay-Delta Plan. The same analysis and compliance with Water Code sections 13240-13247 is required for any new water quality objective(s) for EC that the Regional Water Board may adopt in lieu of applying the 2006 Bay-Delta Plan water quality objective for EC.

c. Affected Implementation Program: The Regional Water Board's Basin Plan does not contain an implementation plan describing how water quality objectives for EC incorporated by reference from the Bay-Delta Plan are to be implemented in relation to municipal wastewater discharges. This lack of a comprehensive implementation plan violates Water Code section 13242 and should be identified as a priority project as a result of this Triennial Review process.

5. Concise Summary of Suggested Revisions:

The City requests that the Regional Water Board expand its analysis of the best method to measure and assess salinity for protection of beneficial uses in the southern Delta beyond EC, to include analysis of TDS (a preferable, more accurate measure), "effective" EC (only measuring the relevant EC that may impact agricultural beneficial uses, discussed in further detail below), and/or individual salinity-related constituents, and then determine the most accurate and cost-effective manner to regulate salinity for the benefit of all interests in the southern Delta.

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<sup>1</sup> The City understands that the Regional Water Board has made a finding of impaired water quality due to EC in the southern Delta; however, no assessment record exists according to the Regional Water Board's 2008 3059b) report, nor has existing salinity concentrations been linked with actual adverse effect on agricultural beneficial uses in the southern Delta.

In the meantime, the Regional Water Board should only implement the pre-2006 Bay-Delta Plan provisions related to EC in the southern Delta that were incorporated by reference into the Basin Plan. If the Regional Water Board ultimately adopts numeric water quality objectives for EC or a different constituent for application to the entire southern Delta, applicable to municipal discharges, in accordance with Water Code sections 13240-13247, the City recommends that those water quality objectives be carefully fashioned to *reasonably* protect the agricultural supply beneficial uses, and not simply default to overly conservative values unnecessary for most of the agricultural beneficial uses of the southern Delta receiving waters.

6. Supporting Data, Information or Evidence

a. Under Water Code section 13000, regulation of water quality must be reasonable, and must strike a balance between competing interests, costs, and benefits. Imposing water quality objectives that are conservatively protective of the most salt-sensitive agricultural crops, which occupy only a minor percentage of the southern Delta (per the recent draft Hoffman report), is not reasonable, and does not strike the right balance between the various interests, costs, and benefits. If the Regional Water Board believes that the entire southern Delta must be conservatively protected for the most salt-sensitive agricultural use under the current broad beneficial use designation, then the Regional Water Board ought to consider conducting a use attainability analysis to de-designate or subcategorize the applicable agricultural beneficial uses under 40 C.F.R. §131.10 so that more site-specific objectives can be adopted and applied.

b. Use of FAO 29 (Ayers and Westcot, 1985) to impose water quality requirements for EC is not reasonable. The Ayers and Westcot report has been shown to be overly conservative for protection of salt-sensitive beans and alfalfa grown in the Southern Delta, and does not reflect soil and climate characteristics that are relevant to local conditions.

c. If the Regional Water Board plans to incorporate by reference the 2006 Bay-Delta Plan water quality objectives for EC for the southern Delta, or if wholly separate, new water quality objectives for EC or other constituents, are adopted, the Regional Water Board must comply with Water Code sections 13241 and 13242.

d. The City believes that the Regional Water Board should expand its analysis of the best method to measure and assess salinity for protection of beneficial uses in the southern Delta beyond EC, to include TDS (a preferable, more accurate measure), “effective” EC (only measuring the relevant EC that may impact agricultural beneficial uses), and/or individual salinity-related constituents, and then determine the most accurate and cost-effective manner to regulate salinity for the benefit of all interests in the southern Delta. The overly simplified characterization of water quality when based on EC alone begs for further analysis of the salinity-related constituents present in the water and their relative effects on water use. The City requests that the Regional Water Board work with the State Water Board to act expeditiously to

investigate and adopt, if appropriate, alternative standards to EC that would allow municipalities to comply with salinity objectives in the southern Delta without the need for installing costly and energy-wasting advanced treatment such as reverse osmosis.<sup>2</sup> Dr. Glenn Hoffman, of the USDA Salinity Laboratory, has been contracted to evaluate salinity thresholds based on effects to agriculture. Dr. Hoffman's draft study was recently made available and, once finalized, the study results should be used to adopt or modify the applicable salinity objectives to more reasonably protect the agricultural supply beneficial use in the southern Delta.

e. EC merely represents the ability of a material to carry electrical current. In water, EC is generally used as a measure of the mineral or other ionic concentration. However, conductivity is only a quantitative measurement and cannot distinguish particular conductive materials in the presence of others. Many ions contribute to EC, but some are not problematic for, and may even be a necessity, for irrigated agriculture. Thus, EC levels that may be currently regarded as in excess of recommended levels (*e.g.*, in excess of the conservative levels set forth in FAO 29) do not necessarily equate to impaired waters for agricultural use. The Regional Board should consider using other factors instead of or, in combination with, EC for ensuring the most site-specific reasonable salinity objectives are derived to protect local agricultural uses. The level of soil salinity that will interfere with plant growth depends on the plant species, texture and water holding capacity of the soil, and composition of the salts (Marschner, 1995). According to Marschner, using EC of the irrigation water alone as an indicator for plant growth in saline soils is insufficient, in part because EC characterizes only the total salt content, not its composition. While sodium chloride is typically the dominant salt in solution, others may also be present in various combinations, depending on the origin of the saline water and the solubility of the salts. Depending upon the electrolytes present in the soil solution, precipitation reactions and/or ionic interactions could occur, thereby reducing the "effective" salinity to which plants are exposed. Table 1 below shows solubility of common salts at 25°C.

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<sup>2</sup> For example, if sodium chloride, not EC, was the primary constituent being evaluated for salinity-control in the southern Delta, then source control activities could be undertaken and sodium-based products could be substituted for other materials, such as potassium (*e.g.*, water softener industry and local cheese manufacturer could switch from sodium chloride to potassium chloride). Research has indicated that potassium effects on infiltration in western soils do not parallel those of sodium. Therefore, compliance remedies that include substitution of potassium for sodium may provide some ameliorative benefit. Moreover, potassium is a plant nutrient included in many fertilizers. These source control efforts cannot occur if EC is the only measure of salinity in the southern Delta, especially at the conservative levels being imposed, because EC levels could increase with these changes, even though beneficial uses may be more adequately protected.

TABLE 1  
 Solubility of Salts at 25°C  
 (from Marshner, 1995)

Salt	Solubility (mmol l <sup>-1</sup> H <sub>2</sub> O)
Calcium chloride (CaCl <sub>2</sub> •6H <sub>2</sub> O)	12,735
Magnesium chloride (MgCl <sub>2</sub> •6H <sub>2</sub> O)	97,478
Sodium chloride (NaCl)	6,108
Magnesium sulfate (MgSO <sub>4</sub> •7H <sub>2</sub> O)	2,880
Sodium bicarbonate (NaHCO <sub>3</sub> )	821
Sodium sulfate (Na <sub>2</sub> SO <sub>4</sub> •10H <sub>2</sub> O)	341
Calcium sulfate (CaSO <sub>4</sub> •2H <sub>2</sub> O)	15

Constraints for plant growth in saline conditions include 1) drought stress resulting from more negative water potential in the soil water compared to plant root; 2) ion toxicity associated with primarily chloride and sodium; and 3) nutrient imbalance by depression in uptake and/or shoot transport and impaired mineral distribution within the plant tissues (Marschner, 1995). Plants have genetic differences in their abilities to tolerate salinity, ranging from sensitive to tolerant, and salt-tolerant plants vary in their physiological mechanisms of adaptation. The State Water Board's purported water quality objective for EC in the southern Delta in the 2006 Bay-Delta Plan is based on the salinity level that begins to impede growth of beans and alfalfa, which are very salt-sensitive crops. Numerous reports have challenged the validity of that EC objective, and have proposed higher EC values that would be equally protective of salt-sensitive crops. Even if the State Water Board's EC objective were an accurate reflection of the salinity threshold of beans and alfalfa, the objective would be overly conservative, and therefore unreasonable, if more salt-tolerant crops comprise the majority of irrigated agriculture in the southern Delta. The recently issued draft report by Dr. Hoffman indicates that salt-sensitive crops, such as beans, comprise a very small percentage of the use area. Further, soil drainage characteristics can allow for a sufficient leaching fraction to flush excess salts from the plant root zone to levels that could be tolerated by sensitive plants. Because the Regional Water Board's Basin Plan includes leaching of excess salts as a component of the Agricultural Supply beneficial use, any water quality objective that does not consider leaching capacity does not adequately address beneficial uses.

f. In the 1978 Bay-Delta Plan, the State Water Board adopted water quality objectives for salinity based on EC at four compliance locations in the southern Delta. These objectives were based on methodologies available at that time for estimating the maximum salinity of applied irrigation water that would sustain 100 percent yield of important salt sensitive

crops grown in the southern Delta. The objectives were also based on the assumption that the Department of Water Resources (DWR) would install permanent operable barriers in the southern Delta and that the objectives would be met by flow modifications undertaken by the state and federal agencies responsible for flows in and through the Delta (DWR and Bureau of Reclamation). The Bay-Delta Plan's water quality objectives did not apply throughout the southern Delta and were inapplicable to municipal dischargers, such as the City. The Regional Water Board's Basin Plan currently references the 1991 Bay-Delta Plan, which has just four compliance points for the salinity objectives. *See* footnote on Table III-5, stating “\* Taken from the State Water Board’s ‘Water Quality Control Plan for Salinity,’ May 1991”; *see also* Basin Plan at pg. III-6.00 “Salinity.”

In 2006, without supporting environmental analysis, or analysis under Water Code section 13241, and under the guise of “non-substantive modifications,” the State Water Board purported to act to extend the applicability of the previously adopted water quality objectives for EC throughout the southern Delta, and applied the objective to stakeholders not previously covered (*e.g.*, municipal dischargers). The Bay-Delta Plan's implementation plan was not modified to include municipal dischargers as an entity required to take actions necessary to achieve the objective, did not describe appropriate actions, did not include a time schedule for such actions, and did not include a description of the surveillance to be undertaken to determine compliance by municipalities, all in contravention of Water Code section 13242. Although the Office of Administrative Law approved the 2006 modifications to the Bay-Delta Plan, the U.S. EPA has not yet approved the modification. Until the 2006 modifications are approved by U.S. EPA, they cannot be properly used for 303(d) listing decisions or NPDES permitting decisions. Further, until or unless the Regional Water Board's Basin Plan is specifically amended to include the approved 2006 Bay-Delta Plan, the Regional Water Board must refrain from applying that version of the Bay-Delta Plan to the southern Delta and dischargers thereto, such as the City.

7. Concise Summary of Data, Information or Evidence:

- (a) Water quality objectives for EC for the southern Delta need not be overly conservative so as to be unreasonable or unnecessary for adequate protection of the Agricultural Supply beneficial use. Use of EC as the simple measure of salinity should be re-evaluated by the Regional Water Board, and alternative measures, such as TDS, “effective” EC, or more specific salinity compounds (*e.g.*, if individual constituents that comprise EC are more directly relevant to reasonable protection of beneficial uses and allow compliance flexibility), should be investigated and used if more accurate and reasonable regulation will result.
- (b) If EC is retained as the measure for salinity, new numeric water quality objectives for EC should be adopted based on recent information and studies, to provide for the *reasonable* protection of the Agricultural Supply beneficial use.
- (c) The Regional Water Board must comply with Water Code section 13241 and 13242, if incorporating water quality objectives from updates to the State Water

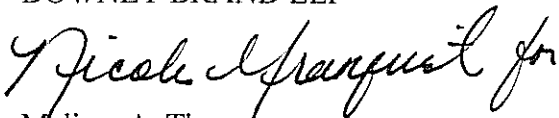
Board's Bay-Delta Plan, or adopting new water quality objectives for the southern Delta. It is imperative that the Regional Water Board provide a comprehensive implementation plan for salinity that specifically addresses feasible steps for municipal wastewater dischargers to take to achieve compliance.

8. Stakeholder Support for Suggested Revisions to the Basin Plan: There are numerous stakeholders involved in the salinity issues of the Central Valley, including CV-Salts and the members of the Central Valley Clean Water Agencies and the Association of California Water Agencies. There are also industrial stakeholders that would be interested in these changes, such as Leprino Foods, which is a cheese manufacturer located in the City of Tracy.

9. Financial Support for Suggested Revisions to the Basin Plan: The City's NPDES Permit requires that "[t]he Discharger participates financially in the development of the Central Valley Salinity Management Plan at a level commensurate with its contributions of salinity to the Southern Delta." See Order No. R5-2007-0036 at pg. 9, Provision IV.A.i.3. In accordance with this provision, the City has already financially contributed to the CV-Salts process. If the Regional Water Board and/or State Water Board seeks amendment to the Basin Plan and Bay-Delta Plan to achieve more reasonable regulatory requirements for salinity control, and avoid the City having to expend extremely scarce resources on unnecessary advanced treatment processes that may produce other adverse environmental impacts, the City is willing to commit further financial resources towards that effort.

Respectfully submitted,

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